New England Bioassay

A Division of GZA

GEOTECHNICAL
ENVIRONMENTAL
ECOLOGICAL
WATER
CONSTRUCTION MANAGEMENT

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ACUTE AQUATIC TOXICITY TEST REPORT

Pease Wastewater Treatment Plant
NPDES Permit: NH 0090000
Receiving Water: Piscataqua River

Test Start Date: 8/12/16

Test Period: August 2016

Report Prepared by:

New England Bioassay
A Division of GZA GeoEnvironmental, Inc.
77 Batson Dr.
Manchester, CT 06042

GZA Project Number: 05.0044856.00

Report Date: September 7, 2016

Report Submitted to:

City of Portsmouth
Pease Wastewater Treatment Plant
135 Corporate Drive
Porstmouth, NH 03801

Sample ID: DSN 005

Please contact the Lab Manager, Kim Wills, at (860) 858-3153 or kimberly.wills@gza.com if you have any questions concerning these results.

Whole Effluent Toxicity Testing Report Instruction Form

Client Name/Project: Pease WWTP Test Date: 8/12/16

Sample ID: DSN 005

Your results were as follows:

☒ Pass

□ Fail – Please proceed according to the instructions in your permit.

□ Invalid – **Retesting is still required. Retest report will be sent at a later date under separate cover.**

□ Original Test Invalid – **Valid retest performed. Both test and retest results are attached.**

□ Retesting will be or has been performed according to the Case 1 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water.

□ This is your _____ case of dilution water toxicity. Please proceed according to the Case 2 Protocols outlined in the attached copy of EPA-New England's species-specific, self-implementing policy for alternate dilution water. The alternate dilution water you select for future tests for this species should be described as follows: "synthetic laboratory water made up according to EPA's toxicity test protocols, by adding specified amounts of salts into deionized water in order to match the hardness of our receiving water." Writing this letter should help you to avoid retests in the future.

□ Available information is insufficient to determine whether this test passed or failed. Please compare results to your permit limits. Please submit a current copy of your permit to the GZA Lab so that we can determine the status of future tests results and help ensure your compliance with permit requirements.

Please complete the items on this list before reporting these results according to the instructions in the "Monitoring and Reporting" Section of your permit.

- Please complete, sign and date the upper portion of the "Whole Effluent Toxicity Test Report Certification" page which is the page directly following this page.
- Fill in the Sample Type and Sample Method (upper right) and the Permit Limits (lower left) on the GeoEnvironmental, Inc.-EPA Toxicity Test Summary Sheet(s) if they are incomplete.
- Fill in any missing information on the GZA Chain-of-Custody documents. This includes ensuring that the following information is recorded: Sampler's name and title, Facility name and address, Sample collection methods, Sample collection start and end dates and times, Types of sample, Chlorination status of samples upon shipment to GZA, Site description and Sample collection procedures.
- Monitoring results should be summarized on your monthly Discharge Monitoring Report Form.
- Signed and dated originals of this report must be submitted to the State (and Federal) Agencies specified in the "Monitoring and Reporting" section of your permit.

Questions? Please contact the Lab Manager, Kim Wills, at (860) 858-3153 or kimberly.wills@gza.com.

Recd

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Permittee)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on 9/14/16
[Date]

[Authorized Signature]

Terry Desmarais, City Engineer
[Print or Type Name and Title]

City of Portsmouth NH
[Print or Type the Permittee's Name]

NH 0090000 Outfall 005A
[Print or Type the NPDES Permit No.]

Since the WET test and report check is complicated, the GZA GeoEnvironmental, Inc. Aquatic Toxicity Laboratory has certified the validity of the WET test data in the section below. Please note that this does not relieve the permittee from its responsibility to sign and certify the report under 40 C.F.R. S 122.41(k).

WHOLE EFFLUENT TOXICITY TEST REPORT CERTIFICATION (Bioassay Laboratory)

I certify under penalty of law that this document and all ATTACHMENTS were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

Executed on 9/7/16
[Date]

[Authorized Signature]

Kim Wills, Laboratory Manager
[Print or Type Name and Title]

New England Bioassay, a division of GZA
[Print or Type Name of Bioassay Laboratory]

24. Telephone Contacts
If you have questions, please contact Joy Hilton, Water Technical Unit, at (617) 918-1877 or David McDonald, Ecosystem Assessment Unit, at (617) 918-8609.

SUMMARY

Client: Pease Wastewater Treatment Plant

NPDES Number: NH 0090000

Job Number: 05.0044856.00

Test Numbers: 16-1158a (*Mysidopsis bahia)*
16-1158b (*Menidia beryllina*)

Test Material: DSN 005 Effluent
NEB Sample ID. No.C36-2892

Sample Dates: 8/10-11/16

Test Dates: 8/12-14/16

Test Duration: 48-h Static Acute

Test Methods: U.S. Environmental Protection Agency (EPA) Methods for Measuring the Acute Toxicity of Effluents to Freshwater and Marine Organisms, (1993, (EPA 600/4-90/027F; 2002, EPA-821-R-02-012) and
EPA Region 1 (New England) Modified Methods.

Test Species: Mysid (*Mysidopsis bahia*; aka *Americamysis*):

Source: New England Bioassay Cultures **Age:** 5 days old

Inland silverside (*Menidia beryllina*):

Source: Aquatic Indicators, Inc. **Age:** 12 days old

Dilution Water: Piscataqua River
(NEB Sample ID. No. C36-2893)

Receiving Water: Piscataqua River

Results:

Test Species	Test Exposure Duration	LC_{50} (% effluent)	A-NOEC (% effluent)	Permit Limit (LC_{50}) (% effluent)	Meets Permit Limits? (Yes/No)	Tests Meet Protocol Limit? (Yes/No)
Mysid: *Mysidopsis bahia*	**48 h**	**>100%**	**100%**	**50%**	**Yes**	**Yes**
Inland silverside: *Menidia beryllina*	**48 h**	**94.0%**	**50%**	**50%**	**Yes**	**Yes**

Facility Name: Pease WWTP Test Start Date: 8/12/16
NPDES Permit Number: NH0090000 Pipe Number: _____

Test Type	Test Species	Sample Type	Sample Method
X Acute	_ Fathead Minnow	_ Prechlorinated	_ Grab
_ Chronic	_ Ceriodaphnia	X Dechlorinated	X Composite
_ Modified (chronic reporting acute values)	_ Daphnia Pulex	_ Chlorine Spiked in Lab	_ Flowthru
	X Mysid Shrimp	_ Chlorinated on site	_ Other
_ 24hr screening	_ Sheepshead	_ Unchlorinated	
	_ Menidia		
	_ Sea Urchin		
	_ Champia		
	_ Selenastrum		

Dilution Water

X receiving water collected at a point upstream of or away from the discharge, free from toxicity or other sources of contamination; (Receiving water name: Piscataqua River)

_ alternate surface water of known quality and a hardness, etc. to generally reflect the characteristics of the receiving water; (Surface water name: _____)

_ synthetic water prepared using either Millipore Mill-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water;

_ or artificial sea salts mixed with deionized water;

_ deionized water and hypersaline brine; or

_ other _____

Effluent sampling date (s): 8/10-11/16

Effluent concentrations tested (in%): 0 6.25 12.5 25 50 100
* Permit limit concentration: 100%

Was effluent salinity adjusted? Yes If yes, to what value? 25 ppt
With sea salts? Yes Hypersaline brine solution? No
Actual effluent concentrations tested after salinity adjustment (%): 0 6.25 12.5 25 50 100

Reference Toxicant test date: 8/1/16

Test Acceptability Criteria

Mean Control Survival:	100%	Mean Control Reproduction:	N/A
Mean Diluent Survival:	100%	Mean Diluent Reproduction:	N/A
Mean Control Weight:	N/A	Mean Control Cell Count:	N/A
Mean Diluent Weight:	N/A	Mean Diluent Cell Count:	N/A

	Limits		Results
LC50	50%	LC50	>100%
		Upper Value	±∞
		Lower Value	100%
		Data Analysis Method Used	Graphical
A-NOEC		A-NOEC	100%
C-NOEC	N/A	C-NOEC	-------
		LOEC	-------
IC25	N/A	IC25	-------
IC50	N/A	IC50	-------

New England Bioassay a division of GZA GeoEnvironmental – EPA Summary Sheet

Facility Name: Pease WWTP Test Start Date: 8/12/16
NPDES Permit Number: NH NH0090000 Pipe Number: _____

Test Type	Test Species	Sample Type	Sample Method
X Acute	_ Fathead Minnow	_ Prechlorinated	_ Grab
_ Chronic	_ Ceriodaphnia	X Dechlorinated	X Composite
_ Modified (chronic reporting acute values)	_ Daphnia Pulex	_ Chlorine Spiked in Lab	_ Flowthru
	_ Mysid Shrimp	_ Chlorinated on site	_ Other
_ 24hr screening	_ Sheepshead	_ Unchlorinated	
	X Menidia		
	_ Sea Urchin		
	_ Champia		
	_ Selenastrum		

Dilution Water

X receiving water collected at a point upstream of or away from the discharge, free from toxicity or other sources of contamination; (Receiving water name: Piscataqua River)

_ alternate surface water of known quality and a hardness, etc. to generally reflect the characteristics of the receiving water; (Surface water name: _____)

_ synthetic water prepared using either Millipore Mill-Q or equivalent deionized water and reagent grade chemicals; or deionized water combined with mineral water;

_ or artificial sea salts mixed with deionized water;

_ deionized water and hypersaline brine; or

_ other _____

Effluent sampling date (s): 8/10-11/16

Effluent concentrations tested (in%): 0 6.25 12.5 25 50 100
* Permit limit concentration: 100%

Was effluent salinity adjusted? Yes If yes, to what value? 25 ppt
With sea salts? Yes Hypersaline brine solution? No
Actual effluent concentrations tested after salinity adjustment (%): 0 6.25 12.5 25 50 100

Reference Toxicant test date: 8/3/16

Test Acceptability Criteria

Mean Control Survival:	100%	Mean Control Reproduction:	N/A
Mean Diluent Survival:	97.5%	Mean Diluent Reproduction:	N/A
Mean Control Weight:	N/A	Mean Control Cell Count:	N/A
Mean Diluent Weight:	N/A	Mean Diluent Cell Count:	N/A

	Limits		Results
LC50	50%	LC50	94.0%
		Upper Value	118.3%
		Lower Value	74.8%
		Data Analysis Method Used	Spearman
A-NOEC		A-NOEC	50%
C-NOEC	N/A	C-NOEC	-------
		LOEC	-------
IC25	N/A	IC25	-------
IC50	N/A	IC50	-------

MYSIDOPSIS BAHIA AQUATIC TOXICITY TEST REPORT

Test Reference Manual:	EPA 821-R-02-012, "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms and Marine Organisms", Fifth Edition
Test Method:	*Mysidopsis bahia* Acute Toxicity Test – Method 2007.0
Test Type:	Acute Static Non-Renewal Saltwater Test
Salinity:	25 ppt ± 10% for all dilutions by adding ocean salts (Instant Ocean)
Temperature:	25 ± 1°C
Light Quality:	Ambient Laboratory Illumination
Photoperiod:	16 hours light, 8 hours dark
Test Chamber Size:	250 mL
Test Solution Volume:	Minimum 200 mL
Age of Test Organisms:	5 days
Number of Mysids Per Test Chamber:	10
Number of Replicate Test Chambers Per Treatment:	4
Total Number of Mysids Per Test Concentration:	40
Feeding Regime:	Light feeding using concentrated *Artemia* nauplii while holding prior to initiating the test.
Aeration:	Supplemental aeration provided at test initiation
Dilution Water:	Piscataqua River water
Alternate Control Water:	NEB Lab Synthetic Salt Water (salinity 25 ppt)
Effluent Concentrations:	0%, 6.25%, 12.5%, 25%, 50% and 100% effluent
Test Duration:	48 hours
Effect measured:	Mortality – no movement of body appendages on gentle prodding.
Test Acceptability:	≥ 90% survival of test organisms in control solution Yes X No _
Sampling Requirements:	Samples first used within 36 hours of collection Yes X No _
Sample Volume Required:	Minimum 2 liters
Test Organism Source:	New England Bioassay

Test Acceptability Criteria: Mean Alternate Water Control Survival = 100%
Mean Dilution Water Control Survival = 100%

Test Results:	Limits	Results	Status
48-hour LC50	≥ 50%	>100%	Pass X Fail _
Upper Value		±∞	
Lower Value		100%	
Data Analysis Method Used		Graphical	
A-NOEC		100%	

Reference Toxicant Data:

Date:	8/1/16
Toxicant:	Sodium Dodecyl Sulfate
Dilution Water:	NEB Lab Synthetic Salt Water (Instant Ocean)
Toxicant Source:	New England Bioassay
Organism Source:	New England Bioassay
48-hour LC50:	16.3 mg/L
In Acceptable Range:	Yes X No _____

Dechlorination Procedures: Chlorine is measured using 4500 CL-G DPD Colorimetric Method.

X Dechlorination was not required

_ Sample was dechlorinated by adding sodium thiosulfate to the sample prior to test initiation. Since dechlorination of the effluent was necessary, a thiosulfate control of diluent water spiked with sodium thiosulfate was also included in the test series. Chlorine was _____ mg/L in a dechlorinated sample.

_ Chlorine Measurement was elevated due to interference. Chlorine was _____ mg/L in a filtered sample.

_ Total Residual Chlorine was re-measured following sample aeration, and was found to be _____ mg/L.

Additional Notes or Other Conditions Affecting the Test:

MENIDIA BERYLLINA AQUATIC TOXICITY TEST REPORT

Test Reference Manual:	EPA 821-R-02-012, "Methods for Measuring the Acute Toxicity of Effluents and Receiving Waters to Freshwater Organisms and Marine Organisms", Fifth Edition
Test Method:	*Menidia beryllina* Acute Toxicity Test – Method 2006.0
Test Type:	Acute Static Non-Renewal Saltwater Test
Salinity:	25 ppt ± 2 ppt by adding dry ocean salts (Instant Ocean)
Temperature :	25 ± 1°C
Light Quality:	Ambient Laboratory Illumination
Photoperiod:	16 hours light, 8 hours dark
Test Chamber Size:	250 mL
Test Solution Volume:	Minimum 200 mL/replicate
Age of Test Organisms:	12 days old (24 hour age range)
Number of Fish Per Test Chamber:	10
Number of Replicate Test Chambers Per Treatment:	4
Total Number of Organisms Per Test Concentration:	40
Feeding Regime:	Light feeding using concentrated *Artemia* nauplii while holding prior to initiating the test.
Aeration:	Supplemental aeration provided at test initiation
Dilution Water:	Piscataqua River water
Alternate Control Water:	NEB Lab Synthetic Salt Water (salinity 25 ppt)
Effluent Concentrations:	0%, 6.25%, 12.5%, 25%, 50% and 100% effluent
Test Duration:	48 hours
Effect measured:	Mortality – no movement on gentle prodding.
Test Acceptability:	≥ 90% survival of test organisms in control solution Yes X No _
Sampling Requirements:	Samples first used within 36 hours of collection Yes X No _
Sample Volume Required:	Minimum 2 liters
Test Organism Source:	Aquatic Indicators

Test Acceptability Criteria: Mean Alternate Water Control Survival = 100%
Mean Dilution Water Control Survival = 97.5%

Test Results:	Limits	Results	Status
48-hour LC50	≥ 50%	94.0%	Pass X Fail __
Upper Value		118.3%	
Lower Value		74.8%	
Data Analysis Method Used		Spearman	
A-NOEC		50%	

Reference Toxicant Data:

Date:	8/3/16
Toxicant:	Sodium Dodecyl Sulfate
Dilution Water:	NEB Lab Synthetic Salt Water (Instant Ocean)
Toxicant Source:	New England Bioassay
Organism Source:	Aquatic Indicators
48-hour LC50:	8.66 mg/L
In Acceptable Range:	Yes X No _____

Dechlorination Procedures: Chlorine is measured using 4500 CL-G DPD Colorimetric Method.

X Dechlorination was not required

_ Sample was dechlorinated by adding sodium thiosulfate to the sample prior to test initiation. Since dechlorination of the effluent was necessary, a thiosulfate control of diluent water spiked with sodium thiosulfate was also included in the test series. Chlorine was _____ mg/L in a dechlorinated sample.

_ Chlorine Measurement was elevated due to interference. Chlorine was _____ mg/L in a filtered sample.

_ Total Residual Chlorine was re-measured following aeration, and was found to be _____ mg/L.

Additional Notes or Other Conditions Affecting the Test:

NEW ENGLAND BIOASSAY ACUTE TOXICITY DATA FORM
COVER SHEET FOR LC50 TESTS

CLIENT:	City of Portsmouth
ADDRESS:	135 Corporate Drive
	Portsmouth, NH 03801
SAMPLE TYPE:	Pease WWTP - DSN 005
DILUTION WATER:	Piscataqua River

M.bahia TEST ID #	16-1158a
M.beryllina TEST ID #	16-1158b
COC #	c36-2892/93
PROJECT #	05.0044856.00

Sample Date(s): 8/10-11/16

Received On: 8/11/16

INVERTEBRATES

TEST SET UP (TECH INIT)	PD
TEST SPECIES	*Mysidopsis bahia*
NEB LOT#	Mb16 (8-7)
AGE	5 days
TEST SOLUTION VOLUME (mls)	200
NO. ORGANISMS PER TEST CHAMBER	10
NO. ORGANISMS PER CONCENTRATION	40
NO. ORGANISMS PER CONTROL	40

	DATE	TIME
TEST START:	8/12/16	1730
TEST END:	8/14/16	1630

VERTEBRATES

TEST SET UP (TECH INIT)	PD
TEST SPECIES	*Menidia beryllina*
NEB LOT#	Ss16AI (8-10)
AGE	12 days
TEST SOLUTION VOLUME (mls)	700
NO. ORGANISMS PER TEST CHAMBER	10
NO. ORGANISMS PER CONCENTRATION	40
NO. ORGANISMS PER CONTROL	40

	DATE	TIME
TEST START:	8/12/16	1600
TEST END:	8/14/16	1500

LABORATORY CONTROL WATER:

			Salinity (ppt)	Alkalinity (mg/L $CaCO_3$)
ARTIFICIAL SW:	NEB BATCH#	CRIO36-025	25	120

RESULTS OF *Mysidopsis bahia* LC50 TEST

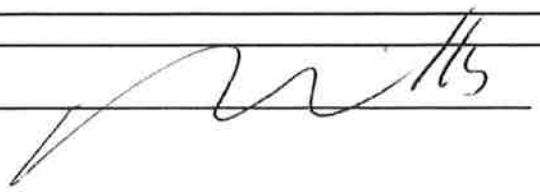
METHOD	LC50 (%)	95% Confidence Limits
BINOMIAL/GRAPHICAL	>100%	100%±∞
PROBIT		
SPEARMAN KARBER		
NOAEL	100%	

RESULTS OF *Menidia beryllina* LC50 TEST

METHOD	LC50 (%)	95% Confidence Limits
BINOMIAL/GRAPHICAL	94.0%	74.8% - 118.3%
PROBIT		
SPEARMAN KARBER		
NOAEL	50%	

NOEC: NO OBSERVABLE EFFECT CONCENTRATION

Comments:

REVIEWD BY:  DATE: 9/7/16

NEW ENGLAND BIOASSAY
Toxicity Test Data Sheet

NEB Test #: 16-1158a
Test Organism: *Mysidopsis bahia*
Project #: 05.0044856.00
Organism Age: 5 days
Facility Name: Pease WWTP
Test Duration: 48 (hours)
Date Sampled: 8/10-11/16
Beginning Date: 8/12/16 Time: 1730
Date Received: 8/11/16
Dilution Water Source: Piscataqua River
Sample ID: DSN 005
Salinity: 25 ppt

Effluent Conc. %	Number of Surviving Organisms			Dissolved Oxygen (mg/L)			Temperature (°C)			pH (su)			Salinity (ppt)		
Initials	PD	CB	CB	PD	CB	CB	PD	CB	CB	PD	CB	CB	PD	CB	CB
	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control A	10	10	10	7.2	7.4	6.9	24.7	24.3	24.3	8.0	8.0	8.0	25	26	26
Control B	10	10	10		7.2	6.9		24.6	24.3		8.0	8.1		25	26
Control C	10	10	10		7.2	7.0		24.6	24.4		8.0	8.1		26	26
Control D	10	10	10		7.1	7.0		24.4	24.4		8.1	8.0		26	26
Diluent A	10	10	10	7.3	7.2	6.2	24.7	24.5	24.4	7.8	7.9	7.8	25	26	26
Diluent B	10	10	10		7.1	6.1		24.5	24.4		7.9	7.6		26	26
Diluent C	10	10	10		7.1	6.2		24.4	24.4		7.8	7.8		26	26
Diluent D	10	10	10		7.1	6.6		24.4	24.3		7.8	7.9		26	27
6.25 A	10	10	10	7.3	7.1	7.1	24.7	24.4	24.3	7.7	7.9	8.0	25	25	26
6.25 B	10	10	10		7.0	7.0		24.3	24.3		8.0	8.0		25	26
6.25 C	10	10	10		7.0	7.0		24.2	24.4		7.9	8.0		26	26
6.25 D	10	10	10		7.0	6.9		24.1	24.3		8.0	8.0		26	27
12.5 A	10	10	10	7.2	7.1	6.8	24.7	24.4	24.3	7.7	8.0	8.1	24	25	26
12.5 B	10	10	10		7.2	6.9		24.2	24.3		8.0	8.1		26	27
12.5 C	10	10	10		7.1	7.0		24.4	24.4		8.0	8.1		25	25
12.5 D	10	10	10		7.0	6.8		24.1	24.2		8.0	8.1		27	30
25 A	10	10	10	7.2	7.0	6.9	24.7	24.3	24.2	7.7	8.2	8.2	24	25	26
25 B	10	10	10		7.0	6.9		24.3	24.3		8.2	8.2		25	26
25 C	10	10	10		7.0	6.8		24.2	24.2		8.2	8.3		25	26
25 D	10	10	10		7.1	6.9		24.3	24.2		8.2	8.3		26	27

LC50	Confidence Interval	A-NOEC	Computational Method
>100%	100%±∞	100%	Graphical

NEW ENGLAND BIOASSAY
Toxicity Test Data Sheet

NEB Test #: 16-1158a
Project #: 05.0044856.00
Facility Name: Pease WWTP
Date Sampled: 8/10-11/16
Date Received: 8/11/16
Sample ID: DSN 005

Test Organism: *Mysidopsis bahia*
Organism Age: 5 days
Test Duration: 48 (hours)
Beginning Date: 8/12/16 Time: 1730
Dilution Water Source: Piscataqua River
Salinity: 25 ppt

Effluent Conc. %	Number of Surviving Organisms			Dissolved Oxygen (mg/L)			Temperature (°C)			pH (su)			Salinity (ppt)		
Initials	PD	CB	CB	PD	CB	CB	PD	CB	CB	PD	CB	CB	PD	CB	CB
	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
50 A	10	10	10	7.1	7.0	6.9	24.7	24.3	24.2	7.7	8.3	8.4	24	25	26
50 B	10	10	10		7.0	7.0		24.5	24.3		8.3	8.4		25	25
50 C	10	10	10		7.0	6.9		24.4	24.4		8.3	8.4		24	25
50 D	10	10	10		7.0	6.9		24.5	24.3		8.3	8.4		25	25
100 A	10	10	10	7.0	7.3	7.0	24.7	24.4	24.2	7.6	8.5	8.6	23	24	24
100 B	10	10	10		6.9	6.8		24.4	24.3		8.5	8.6		24	24
100 C	10	10	10		6.9	6.8		24.3	24.4		8.5	8.6		24	24
100 D	10	10	10		6.8	6.7		24.2	24.4		8.5	8.6		24	24

LC50	Confidence Interval	A-NOEC	Computational Method
>100%	100%±∞	100%	Graphical

NEW ENGLAND BIOASSAY
Toxicity Test Data Sheet

NEB Test #: 16-1158b
Project #: 05.0044856.00
Facility Name: Pease WWTP
Date Sampled: 8/10-11/16
Date Received: 8/11/16
Sample ID: DSN 005

Test Organism: *Menidia beryllina*
Organism Age: 12 days
Test Duration: 48 (hours)
Beginning Date: 8/12/16 Time: 1600
Dilution Water Source: Piscataqua River
Salinity: 25 ppt

Effluent Conc. %	Number of Surviving Organisms			Dissolved Oxygen (mg/L)			Temperature (°C)			pH (su)			Salinity (ppt)		
Initials	PD	CB	CB	PD	CB	CB	PD	CB	CB	PD	CB	CB	PD	CB	CB
	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
Control A	10	10	10	7.2	7.2	7.2	24.7	24.8	24.4	8.0	8.1	8.0	25	25	25
Control B	10	10	10		7.2	7.2		24.8	24.6		8.0	8.0		25	25
Control C	10	10	10		7.1	7.2		24.8	24.8		8.1	8.1		25	25
Control D	10	10	10		7.2	7.2		24.7	24.7		8.1	8.1		25	25
Diluent A	10	10	10	7.3	7.2	7.2	24.7	24.8	24.6	7.8	8.0	8.0	25	25	25
Diluent B	10	9	9		7.1	7.2		24.7	24.5		7.9	8.0		25	25
Diluent C	10	10	10		7.1	7.2		24.6	24.6		8.0	8.0		25	25
Diluent D	10	10	10		7.2	7.2		24.6	24.6		8.0	8.0		25	25
6.25 A	10	10	10	7.3	7.2	7.2	24.7	24.7	24.6	7.7	8.1	8.1	25	25	25
6.25 B	10	10	10		7.2	7.1		24.7	24.6		8.1	8.1		25	25
6.25 C	10	10	10		7.2	7.2		24.6	24.6		8.1	8.1		25	25
6.25 D	10	9	9		7.2	7.2		24.7	24.6		8.1	8.1		25	25
12.5 A	10	10	10	7.2	6.1	5.9	24.7	24.7	24.6	7.7	7.8	7.9	24	25	25
12.5 B	10	10	10		6.8	6.4		24.4	24.4		8.2	8.2		25	25
12.5 C	10	10	10		7.2	7.1		24.4	24.5		8.2	8.2		25	25
12.5 D	10	10	10		7.2	7.2		24.4	24.5		8.2	8.2		25	25
25 A	10	10	9	7.2	7.2	7.2	24.7	24.6	24.3	7.7	8.2	8.3	24	25	25
25 B	10	10	10		7.1	7.2		24.5	24.4		8.3	8.3		25	25
25 C	10	10	10		6.1	7.1		24.6	24.4		7.8	8.3		25	25
25 D	10	10	10		7.0	7.1		24.5	24.2		8.2	8.3		25	25

LC50	Confidence Interval	A-NOEC	Computational Method
94.0%	74.8% - 118.3%	50%	Spearman

NEW ENGLAND BIOASSAY
Toxicity Test Data Sheet

NEB Test #: 16-1158b
Project #: 05.0044856.00
Facility Name: Pease WWTP
Date Sampled: 8/10-11/16
Date Received: 8/11/16
Sample ID: DSN 005

Test Organism: *Menidia beryllina*
Organism Age: 12 days
Test Duration: 48 (hours)
Beginning Date: 8/12/16 Time: 1600
Dilution Water Source: Piscataqua River
Salinity: 25 ppt

Effluent Conc. %	Number of Surviving Organisms			Dissolved Oxygen (mg/L)			Temperature (°C)			pH (su)			Salinity (ppt)		
Initials	PD	CB	CB	PD	CB	CB	PD	CB	CB	PD	CB	CB	PD	CB	CB
	0	24	48	0	24	48	0	24	48	0	24	48	0	24	48
50 A	10	10	8	7.1	7.3	7.1	24.7	24.4	24.5	7.7	8.4	8.4	24	24	24
50 B	10	10	10		7.2	7.1		24.4	24.4		8.4	8.4		24	24
50 C	10	10	9		7.1	7.0		24.5	24.5		8.4	8.4		24	24
50 D	10	9	8		7.1	7.0		24.4	24.4		8.3	8.3		24	25
100 A	10	8	1	7.0	7.2	7.0	24.7	24.6	24.5	7.6	8.4	8.5	23	23	23
100 B	10	8	3		7.1	7.0		24.6	24.5		8.5	8.6		23	23
100 C	10	10	5		7.1	7.0		24.6	24.5		8.3	8.5		23	23
100 D	10	10	9		7.0	6.9		24.6	24.4		8.3	8.5		23	24

LC50	Confidence Interval	A-NOEC	Computational Method
94.0%	74.8% - 118.3%	50%	Spearman

CETIS Analytical Report

Inland Silverside 96-h Acute Survival Test — **New England Bioassay**

Analysis ID:	18-4907-1048	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	06 Sep-16 11:34	**Analysis:**	Trimmed Spearman-Kärber	**Official Results:**	Yes
Batch ID:	19-1377-7645	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	12 Aug-16 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Receiving Water
Ending Date:	14 Aug-16 15:00	**Species:**	Menidia beryllina	**Brine:**	
Duration:	47h	**Source:**	Aquatic Indicators, CA	**Age:**	12
Sample ID:	19-4246-6940	**Code:**	73C7B17C	**Client:**	Portsmouth
Sample Date:	11 Aug-16	**Material:**	POTW Effluent	**Project:**	
Receipt Date:	11 Aug-16	**Source:**	Pease WWTP (NH0090000)		
Sample Age:	40h	**Station:**			

Trimmed Spearman-Kärber Estimates

Threshold Option	Threshold	Trim	Mu	Sigma	LC50	95% LCL	95% UCL
Control Threshold	0.025	46.15%	1.973	0.04972	94.07	74.82	118.3

48h Survival Rate Summary — Calculated Variate(A/B)

Conc-%	Code	Count	Mean	Min	Max	Std Err	Std Dev	CV%	%Effect	A	B
0	D	4	0.9750	0.9000	1.0000	0.0250	0.0500	5.13%	0.0%	39	40
50		4	0.8750	0.8000	1.0000	0.0479	0.0957	10.94%	10.26%	35	40
100		4	0.4500	0.1000	0.9000	0.1708	0.3416	75.90%	53.85%	18	40

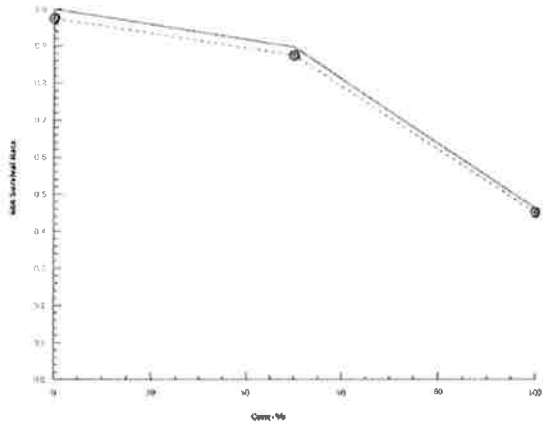
48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.9000	1.0000	1.0000
50		0.8000	1.0000	0.9000	0.8000
100		0.1000	0.3000	0.5000	0.9000

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	9/10	10/10	10/10
50		8/10	10/10	9/10	8/10
100		1/10	3/10	5/10	9/10

Graphics



Inland Silverside 96-h Acute Survival Test — **New England Bioassay**

Analysis ID:	03-7558-4805	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	06 Sep-16 11:31	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes
Batch ID:	19-1377-7645	**Test Type:**	Survival (48h)	**Analyst:**	
Start Date:	12 Aug-16 16:00	**Protocol:**	EPA/821/R-02-012 (2002)	**Diluent:**	Receiving Water
Ending Date:	14 Aug-16 15:00	**Species:**	Menidia beryllina	**Brine:**	
Duration:	47h	**Source:**	Aquatic Indicators, CA	**Age:**	12
Sample ID:	19-4246-6940	**Code:**	73C7B17C	**Client:**	Portsmouth
Sample Date:	11 Aug-16	**Material:**	POTW Effluent	**Project:**	
Receipt Date:	11 Aug-16	**Source:**	Pease WWTP (NH0090000)		
Sample Age:	40h	**Station:**			

Data Transform	Alt Hyp	NOEL	LOEL	TOEL	TU	PMSD
Angular (Corrected)	C > T	100	> 100	n/a	1	21.55%

Steel Many-One Rank Sum Test

Control	vs	Conc-%	Test Stat	Critical	Ties	DF	P-Type	P-Value	Decision(α:5%)
Dilution Water		6.25	18	10	2	6	Asymp	0.8333	Non-Significant Effect
		12.5	20	10	1	6	Asymp	0.9516	Non-Significant Effect
		25	18	10	2	6	Asymp	0.8333	Non-Significant Effect
		50	13	10	2	6	Asymp	0.2311	Non-Significant Effect
		100	10.5	10	1	6	Asymp	0.0586	Non-Significant Effect

ANOVA Table

Source	Sum Squares	Mean Square	DF	F Stat	P-Value	Decision(α:5%)
Between	1.35026	0.270052	5	8.315	3.2E-04	Significant Effect
Error	0.584628	0.0324794	18			
Total	1.93489		23			

Distributional Tests

Attribute	Test	Test Stat	Critical	P-Value	Decision(α:1%)
Variances	Levene Equality of Variance Test	4.106	4.248	0.0116	Equal Variances
Variances	Mod Levene Equality of Variance Test	3.311	4.248	0.0270	Equal Variances
Distribution	Shapiro-Wilk W Normality Test	0.8031	0.884	3.3E-04	Non-Normal Distribution

48h Survival Rate Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	0.00%
6.25		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	0.00%
12.5		4	1.0000	1.0000	1.0000	1.0000	1.0000	1.0000	0.0000	0.00%	-2.56%
25		4	0.9750	0.8954	1.0000	1.0000	0.9000	1.0000	0.0250	5.13%	0.00%
50		4	0.8750	0.7227	1.0000	0.8500	0.8000	1.0000	0.0479	10.94%	10.26%
100		4	0.4500	0.0000	0.9935	0.4000	0.1000	0.9000	0.1708	75.90%	53.85%

Angular (Corrected) Transformed Summary

Conc-%	Code	Count	Mean	95% LCL	95% UCL	Median	Min	Max	Std Err	CV%	%Effect
0	D	4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	0.00%
6.25		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	0.00%
12.5		4	1.412	1.412	1.412	1.412	1.412	1.412	0	0.00%	-2.97%
25		4	1.371	1.242	1.501	1.412	1.249	1.412	0.04074	5.94%	0.00%
50		4	1.219	0.9879	1.45	1.178	1.107	1.412	0.07256	11.91%	11.12%
100		4	0.734	0.1097	1.358	0.6825	0.3218	1.249	0.1961	53.45%	46.48%

Inland Silverside 96-h Acute Survival Test — **New England Bioassay**

Analysis ID:	03-7558-4805	**Endpoint:**	48h Survival Rate	**CETIS Version:**	CETISv1.9.2
Analyzed:	06 Sep-16 11:31	**Analysis:**	Nonparametric-Control vs Treatments	**Official Results:**	Yes

48h Survival Rate Detail

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.0000	0.9000	1.0000	1.0000
6.25		1.0000	1.0000	1.0000	0.9000
12.5		1.0000	1.0000	1.0000	1.0000
25		0.9000	1.0000	1.0000	1.0000
50		0.8000	1.0000	0.9000	0.8000
100		0.1000	0.3000	0.5000	0.9000

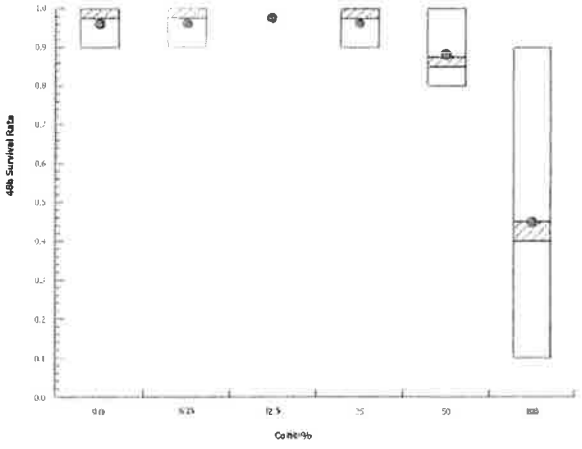
Angular (Corrected) Transformed Detail

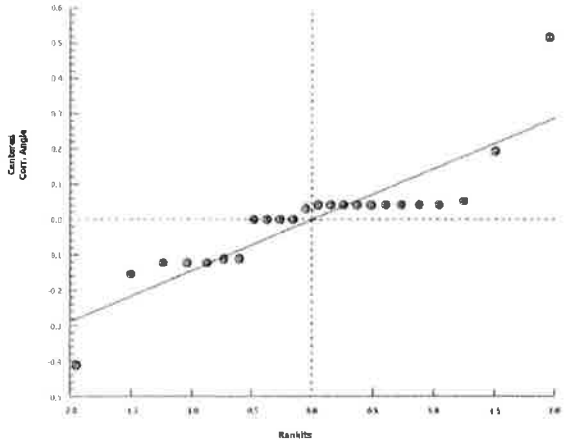
Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	1.412	1.249	1.412	1.412
6.25		1.412	1.412	1.412	1.249
12.5		1.412	1.412	1.412	1.412
25		1.249	1.412	1.412	1.412
50		1.107	1.412	1.249	1.107
100		0.3218	0.5796	0.7854	1.249

48h Survival Rate Binomials

Conc-%	Code	Rep 1	Rep 2	Rep 3	Rep 4
0	D	10/10	9/10	10/10	10/10
6.25		10/10	10/10	10/10	9/10
12.5		10/10	10/10	10/10	10/10
25		9/10	10/10	10/10	10/10
50		8/10	10/10	9/10	8/10
100		1/10	3/10	5/10	9/10

Graphics





INITIAL CHEMISTRY INFORMATION

CLIENT: Pease WWTP

PROJECT # 05.0044856.00

RECIEPT DATE	8/11/16	
SAMPLE	Effluent	Receiving Water
COC #	C36-2892	C36-2893
Temperature (°C)	3.6	3.6
Dissolved Oxygen (mg/L)	4.8	4.7
pH (standard units)	7.6	7.5
Conductivity (µmhos/cm)	4,109	48,490
Salinity (ppt)	2	32
Hardness (as mg/L CaCO3)	184	5900
Alkalinity (as mg/L CaCO3)	440	100
TRC - DPD (mg/L)	0.005	0.002
INITIALS	CB	CB

Additional notes:

River: 15.625L of river was brought up to 20L using D.I. water in order to bring salinity down to 25ppt

Eff: 238.1g of I.O. added to 9 L of effluent to bring salinity up to 23ppt

NEW ENGLAND BIOASSAY - CHAIN-OF-CUSTODY

EFFLUENT

Sampler: Doug Fallon
Title: WWTP Operator
Facility: Pease WWTP

Sampling Method: X **Composite**
Sample ID: DSN 005
Start Date: 8-10-16 Time: 8:10
End Date: 8-11-16 Time: 8:10

Sampling Method: X **Grab** (for pH ,TRC, & TCE X)
Date Collected: 8-11-16
Time Collected: 8:10

Sample Type:
✓ Prechlorinated
✓ Dechlorinated
Unchlorinated
Chlorinated

RECEIVING WATER

Sampler: Tim Babcock
Title: CPO
Facility: Pease WWTP

Sampling Method: X Grab
Sample ID: Piscataqua River
Date Collected: 8-10-16
Time Collected: 6:15 PM

Effluent Sampling Location and Procedures: Effluent sampler, end of contacts

Receiving Water Sampling Location and Procedures: Piscataqua River - upstream of the outfall

Requested Analysis: X Acute Definitive LC50 Test

Sample Shipment

Method of Shipment: NEB Courier

Relinquished By:	Doug Fallon	Date: 8-11-16	Time: 9:30
Received By:	Mike Hoefler	Date: 8-11-16	Time: 0930
Relinquished By:	Mike Hoefler	Date: 8-11-16	Time: 1235
Received By:	Celeste M Perry	Date: 8/11/16	Time: 1235

Optional Information

Purchase Order # to reference on invoice:

FOR NEB USE ONLY

*** Please return all ice packs NEB has provided to insure accurate temperature upon receipt to the NEB laboratory.**

Temperature of Effluent Upon Receipt at Lab: 3.6 °C
Temperature of Receiving Water Upon Receipt at Lab: 3.6 °C

Effluent COC# C36-2892
Receiving Water COC# C36-2893

IF THIS COOLER IS MISPLACED OR THE LABEL IS LOST, PLEASE SHIP TO:
KIM WILLS, NEW ENGLAND BIOASSAY 77 BATSON DRIVE MANCHESTER, CT 06042

PHOENIX
Environmental Laboratories, Inc.

Thursday, August 18, 2016

Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Project ID: PEASE WWTP
Sample ID#s: BN90827 - BN90829

This laboratory is in compliance with the NELAC requirements of procedures used except where indicated.

This report contains results for the parameters tested, under the sampling conditions described on the Chain Of Custody, as received by the laboratory.

A scanned version of the COC form accompanies the analytical report and is an exact duplicate of the original.

If you have any questions concerning this testing, please do not hesitate to contact Phoenix Client Services at ext. 200.

Sincerely yours,

Phyllis Shiller

Phyllis Shiller
Laboratory Director

NELAC - #NY11301
CT Lab Registration #PH-0618
MA Lab Registration #MA-CT-007
ME Lab Registration #CT-007
NH Lab Registration #213693-A,B
NJ Lab Registration #CT-003
NY Lab Registration #11301
PA Lab Registration #68-03530
RI Lab Registration #63
VT Lab Registration #VT11301

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

August 18, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		08/11/16	
Location Code:	NEB	Received by:	LK	08/11/16	14:54
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21800				

Laboratory Data

SDG ID: GBN90827
Phoenix ID: BN90827

Project ID: PEASE WWTP
Client ID: C36-2892 DSN 005 COMP

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference	
Aluminum	0.035	0.010	mg/L	1	08/13/16	LK	E200.7	
Cadmium	< 0.001	0.001	mg/L	1	08/13/16	LK	E200.7	
Chromium	0.002	0.001	mg/L	1	08/13/16	LK	E200.7	
Copper	0.006	0.002	mg/L	1	08/13/16	LK	E200.7	
Nickel	< 0.001	0.001	mg/L	1	08/13/16	LK	E200.7	
Lead	0.0003	0.0003	mg/L	1	08/15/16	RS	SM3113B	
Zinc	0.055	0.002	mg/L	1	08/13/16	LK	E200.7	
Alkalinity-CaCO3	465	5.00	mg/L	1	08/12/16	RR/EG	SM2320B-97	
Ammonia as Nitrogen	4.05	0.05	mg/L	1	08/17/16	WHM	E350.1	
Salinity	2.2	0.5	ppt	1	08/11/16	TC	SM2520B-10	1
Tot. Org. Carbon	35	2.5	mg/L	5	08/17/16	RR/EG	SM5310C/E415.1-00	1
Total Suspended Solids	< 5.0	5.0	mg/L	1	08/12/16	AS/KH	SM2540D-97	
Total Solids	2500	20	mg/L	2	08/15/16	AS/KH	SM2540B-97	
Total Metals Digestion	Completed				08/11/16	AG		

Project ID: PEASE WWTP
Client ID: C36-2892 DSN 005 COMP

Phoenix I.D.: BN90827

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level

Comments:

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.
This report must not be reproduced except in full as defined by the attached chain of custody.

Phyllis Shiller, Laboratory Director
August 18, 2016
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

August 18, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		08/11/16	8:10
Location Code:	NEB	Received by:	LK	08/11/16	14:54
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21800				

Laboratory Data

SDG ID: GBN90827
Phoenix ID: BN90828

Project ID: PEASE WWTP
Client ID: DSN 005 GRAB

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference	
Chlorine Residual	< 0.02	0.02	mg/L	1	08/11/16 17:42	O	SM4500CLG-97	1
pH	7.87	0.10	pH Units	1	08/12/16 09:03	RR/EG	SM4500-H B-00	1
Trichloroethylene	ND	1.0	ug/L	1	08/12/16	MH	E624	

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

Phyllis Shiller, Laboratory Director
August 18, 2016
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

Analysis Report

August 18, 2016

FOR: Attn: Ms. Kim Wills
New England Bioassay
a Division of GZA GeoEnvironmental
77 Batson Drive
Manchester, CT 06040

Sample Information		Custody Information		Date	Time
Matrix:	WASTE WATER	Collected by:		08/10/16	18:15
Location Code:	NEB	Received by:	LK	08/11/16	14:54
Rush Request:	Standard	Analyzed by:	see "By" below		
P.O.#:	21800				

Laboratory Data

SDG ID: GBN90827
Phoenix ID: BN90829

Project ID: PEASE WWTP
Client ID: C36-2893 PISCATAQUA RIVER

Parameter	Result	RL/ PQL	Units	Dilution	Date/Time	By	Reference	
Alkalinity-CaCO3	111	5.00	mg/L	1	08/12/16	RR/EG	SM2320B-97	
Chlorine Residual	< 0.02	0.02	mg/L	1	08/11/16 17:44	O	SM4500CLG-97	1
Ammonia as Nitrogen	0.15	0.05	mg/L	1	08/17/16	WHM	E350.1	
pH	7.90	0.10	pH Units	1	08/12/16 09:25	RR/EG	SM4500-H B-00	1
Salinity	33	0.5	ppt	1	08/11/16	TC	SM2520B-10	1
Tot. Org. Carbon	1.9	0.50	mg/L	1	08/16/16	RR/EG	SM5310C/E415.1-00	1
Total Suspended Solids	28	5.0	mg/L	1	08/12/16	AS/KH	SM2540D-97	
Total Solids	29000	100	mg/L	10	08/12/16	AS/KH	SM2540B-97	

1 = This parameter is not certified by NY NELAC for this matrix. NY NELAC does not offer certification for all parameters at this time.

RL/PQL=Reporting/Practical Quantitation Level (Equivalent to NELAC LOQ, Limit of Quantitation) ND=Not Detected at RL/PQL
BRL=Below Reporting Level

Comments:

The regulatory hold time for pH is immediately. This pH was performed in the laboratory and may be considered outside of hold-time.

The regulatory hold time for Chlorine is immediately. This Chlorine was performed in the laboratory and may be considered outside of hold-time.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

Phyllis Shiller, Laboratory Director
August 18, 2016
Reviewed and Released by: Deb Lawrie, Project Manager

PHOENIX

Environmental Laboratories, Inc.
587 East Middle Turnpike, P.O.Box 370, Manchester, CT 06045
Tel. (860) 645-1102 Fax (860) 645-0823

NY # 11301

QA/QC Report

August 18, 2016

QA/QC Data

SDG I.D.: GBN90827

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 355306 (mg/L), QC Sample No: BN90377 (BN90827)													
Lead (Furnace) - Water	BRL	0.001	0.016	0.018	11.8	95.8			97.5			85 - 115	20
QA/QC Batch 355455 (mg/L), QC Sample No: BN90649 (BN90827)													
ICP Metals - Aqueous													
Aluminum	BRL	0.010	1.16	1.23	5.90	95.8			116			75 - 125	20
Cadmium	BRL	0.001	<0.001	<0.001	NC	99.5			97.3			75 - 125	20
Chromium	BRL	0.001	0.003	0.003	NC	97.9			97.4			75 - 125	20
Copper	BRL	0.005	0.021	0.021	NC	99.2			99.9			75 - 125	20
Nickel	BRL	0.001	0.001	0.002	NC	99.7			98.1			75 - 125	20
Zinc	BRL	0.002	0.032	0.034	6.10	98.5			99.4			75 - 125	20

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ACCREDITED IN ACCORDANCE WITH nelac NY # 11301

QA/QC Report

August 18, 2016

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SDG I.D.: GBN90827

Parameter	Blank	Blk RL	Sample Result	Dup Result	Dup RPD	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 355511 (mg/L), QC Sample No: BN89919 (BN90827, BN90829)													
Total Solids	BRL	10	320	340	6.10	95.0						85 - 115	20
QA/QC Batch 355439 (mg/L), QC Sample No: BN90586 (BN90828, BN90829)													
Chlorine Residual	BRL	0.02	<0.02	<0.02	NC	112							
QA/QC Batch 355509 (mg/L), QC Sample No: BN90751 (BN90827, BN90829)													
Total Suspended Solids	BRL	5.0	7.5	<5.0	NC	87.0						85 - 115	20
QA/QC Batch 355528 (mg/L), QC Sample No: BN90783 (BN90827)													
Alkalinity-CaCO3	BRL	5.00	165	166	0.60	107						85 - 115	20
QA/QC Batch 355524 (pH), QC Sample No: BN90783 (BN90828)													
pH				7.95		98.1						85 - 115	20
QA/QC Batch 355529 (mg/L), QC Sample No: BN90829 (BN90829)													
Alkalinity-CaCO3	BRL	5.00	111	111	0	107						85 - 115	20
QA/QC Batch 355525 (pH), QC Sample No: BN90829 (BN90829)													
pH			7.90	7.85	0.60	98.1						85 - 115	20
QA/QC Batch 355832 (mg/L), QC Sample No: BN91237 (BN90829)													
Total Organic Carbon	BRL	1.0	<1.0	<1.0	NC	94.0			92.0			85 - 115	20
QA/QC Batch 355820 (mg/L), QC Sample No: BN91257 (BN90827, BN90829)													
Ammonia as Nitrogen	BRL	0.05	0.06	0.06	NC	98.0			103			85 - 115	20
QA/QC Batch 355926 (mg/L), QC Sample No: BN92993 (BN90827)													
Tot. Org. Carbon	BRL	0.5		16		95.0			102			85 - 115	20

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August 18, 2016

QA/QC Data

SDG I.D.: GBN90827

Parameter	Blank	Blk RL	LCS %	LCSD %	LCS RPD	MS %	MSD %	MS RPD	% Rec Limits	% RPD Limits
QA/QC Batch 355556 (ug/L), QC Sample No: BN90922 (BN90828)										
Volatiles - Waste Water										
Trichloroethene	ND	1.0	98	89	9.6				70 - 130	30

Comment:

A LCS and LCS Duplicate were performed instead of a matrix spike and matrix spike duplicate.

Additional 8260 criteria: 10% of LCS/LCSD compounds can be outside of acceptance criteria as long as recovery is 40-160%.

If there are any questions regarding this data, please call Phoenix Client Services at extension 200.

RPD - Relative Percent Difference
LCS - Laboratory Control Sample
LCSD - Laboratory Control Sample Duplicate
MS - Matrix Spike
MS Dup - Matrix Spike Duplicate
NC - No Criteria
Intf - Interference

Phyllis Shiller, Laboratory Director
August 18, 2016

Criteria: None

State: NH

Sample Criteria Exceedences Report

GBN90827 - NEB

SampNo	Acode	Phoenix Analyte	Criteria	Result	RL	Criteria	RL Criteria	Analysis Units

*** No Data to Display ***

Cooler: Yes ☑ No ☐
Coolant: IPK ☑ ICE ☐ No ☐

Temp 6 °C Pg of

PHOENIX *Environmental Laboratories, Inc.*

CHAIN OF CUSTODY RECORD

587 East Middle Turnpike, P.O. Box 370, Manchester, CT 06040
Email: info@phoenixlabs.com Fax (860) 645-0823
Client Services (860) 645-8726

Data Delivery:
☐ Fax #:
☒ Email: Kimberly.wills@gza.com

Customer: NEB - A Division of GZA
Address: 77 Batson Drive, Manchester, CT 06042

Project: Pease WWTP
Report to: Kim Wills
Invoice to: Kim Wills
Phone #: (860) 648-9560
Fax #: (860) 646-7169

Project P.O: 21800

This section MUST be completed with Bottle Quantities.

Client Sample - Information - Identification

Sampler's Signature ______ Date ______

Matrix Code:
DW=Drinking Water GW=Ground Water SW=Surface Water WW=Waste Water
RW=Raw Water SE=Sediment SL=Sludge S=Soil SD=Solid W=Wipe
OIL=Oil B=Bulk L=Liquid

Analysis Request

PHOENIX USE ONLY SAMPLE #	Customer Sample Identification	Sample Matrix	Date Sampled	Time Sampled	pH, TRC	TS, TSS, alkalinity	Salinity	DOC	Ammonia	Total Cd, Cr, Cu, Al, Pb, Ni	Total Zn	TCE	Soil VOA Vials [ ] methanol [ ] H2O	GL Soil container [ ] oz	40 ml VOA Vial [ ] As is [ ] HCl	GL Amber [ ] 500ml [ ] As is [ ] H2SO4	PL As is [ ] 250ml [ ] 500ml [ ] 1000ml	PL H2SO4 [ ] 250ml [ ] 500ml	PL HNO3 250ml	PL NaOH 250ml	Bacteria (as is)	Bacteria (w/thio)	
C36-2892	DSN 005 Comp.	WW	n/a			X	X	X	X	X	X					1	1	1	1				90827
	DSN 005 Grab	WW	8/11/16	0810	X							X			3.3		1						90828
C36-2893	Piscataqua River	D	8/10/16	1815	X	X	X	X	X							1	1	1					90829

Relinquished by:	Accepted by:	Date:	Time:
[signature]	[signature]	8/11/16	1330
[signature]	[signature]	8/11/16	14:54

Comments, Special Requirements or Regulations:

Turnaround:
☐ 1 Day*
☐ 2 Days*
☐ 3 Days*
☒ Standard
☐ Other
* SURCHARGE APPLIES

RI
☐ Direct Exposure (Residential)
☐ GW
☐ Other

CT
☐ RCP Cert
☐ GW Protection
☐ SW Protection
☐ GA Mobility
☐ GB Mobility
☐ Residential DEC
☐ I/C DEC
☐ Other

MA
☐ MCP Certification
☐ GW-1
☐ GW-2
☐ GW-3
☐ S-1
☐ S-2
☐ S-3
☐ MWRA eSMART
☐ Other

State where samples were collected: NH

Data Format
☐ Excel
☐ PDF
☐ GIS/Key
☐ EQuIS
☐ Other

Data Package
☐ Tier II Checklist
☐ Full Data Package*
☐ Phoenix Std Report
☐ Other
* SURCHARGE APPLIES

NEB SALTWATER SPEC 'S ACCLIMATION RECORD

Species: Menidia beryllina	Client: Portsmouth - Pease/Peirce Test ID:	Quantity: 560	*Mortality upon arrival
Source: Aquatic Indicators	Lot #: SS16AI(8-10)	Age: 10 days on 8-10-16	* Mortality > 10% - Notify management

Allowable Mortality: > 5% mortality = Notify management.

Allowable Acclimation: Fish = No more than 50% tank volume water change over a 12 (twelve) hour period.

Mysids = Need to be +/- 2 ppt of test dilution water.

Water Chemistry						Observations				
Date	D.O. (mg/L)	p.H. (SU)	Temp. (C) *	Alkal. (mg/L) ml titrant	Sal. (ppt) **	Feedings	Behavioral observations	Do organisms look stressed?	Mortalities	Comments / Treatment type
						AM NOON PM	A = Normal, B = Erratic mov. C = Dead	Yes / No	# of dead organisms removed from tank	
				200						Acclimated to ASW.
8-10-16	14.2	7.7	22.7	4.0 ml	25	AH SJP AH	A	No	0	
8-11-16	6.6	—	22.8	—	25	SJP MG MG	A	No	0	H_2O Δ 6L ASW
8-12-16	6.5	—	23.7	—	25	SJP MG	A	No	0	H_2O Δ 6L ASW

NEW HAMPSHIRE ENVIRONMENTAL LABORATORY ACCREDITATION PROGRAM

29 Hazen Drive, PO Box 95, Concord, NH 03302 (603) 271-2998

PRIMARY ACCREDITATION PARAMETER LIST
ANALYTE LIST NUMBER: 207116-A

NEW ENGLAND BIOASSAY
77 BATSON DRIVE

MANCHESTER CT 06042
(860) 643-9560
Lab ID: 2071

NELAP RECOGNIZED

Analyte Code	Analyte Name	Effective Date	Expiration Date	Matrix	Category	Accr. Type
Method Code: 10213408	**Method Ref.: EPA 2000.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3410	PIMEPHALES PROMELAS (FATHEAD MINNOW)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10213602	**Method Ref.: EPA 2000.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3410	PIMEPHALES PROMELAS (FATHEAD MINNOW)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10214401	**Method Ref.: EPA 2002.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3315	CERIODAPHNIA DUBIA (DAPHNID)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10214809	**Method Ref.: EPA 2002.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3315	CERIODAPHNIA DUBIA (DAPHNID)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10215404	**Method Ref.: EPA 2021.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3350	DAPHNIA MAGNA	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10215608	**Method Ref.: EPA 2021.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3355	DAPHNIA PULEX	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10216407	**Method Ref.: EPA 2006.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3380	MENIDIA BERYLLINA (INLAND SILVERSIDE)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10216601	**Method Ref.: EPA 2004.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3345	CYPRINODON VARIEGATUS (SHEEPSHEAD MINNOW)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10252605	**Method Ref.: EPA 1000.0 EPA/821/R-02/013**	**Revision: 4th ED**		**Date: OCT-02**		
3410	PIMEPHALES PROMELAS (FATHEAD MINNOW)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10253006	**Method Ref.: EPA 1002.0 EPA/821/R-02/013**	**Revision: 4th ED**		**Date: OCT-02**		
3315	CERIODAPHNIA DUBIA (DAPHNID)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10253404	**Method Ref.: EPA 1004.0 EPA/821/R-03/014**	**Revision: 3rd ED**		**Date: OCT-02**		
3345	CYPRINODON VARIEGATUS (SHEEPSHEAD MINNOW)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10253802	**Method Ref.: EPA 1006.0 EPA/821/R-03/014**	**Revision: 3rd ED**		**Date: OCT-02**		
3380	MENIDIA BERYLLINA (INLAND SILVERSIDE)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10254009	**Method Ref.: EPA 1007.0 EPA/821/R-03/014**	**Revision: 3rd ED**		**Date: OCT-02**		
3395	MYSIDOPSIS BAHIA (MYSID)	05/27/2016	05/26/2017	N	WET	IN
Method Code: 10264809	**Method Ref.: EPA 2000.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3410	PIMEPHALES PROMELAS (FATHEAD MINNOW)	05/27/2016	05/26/2017	N	WET	IN
Method Code: NH0114	**Method Ref.: EPA 2007.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3395	MYSIDOPSIS BAHIA (MYSID)	05/27/2016	05/26/2017	N	WET	IN
Method Code: NH0116	**Method Ref.: EPA 2002.0 EPA/821/R-02/012**	**Revision: 5TH ED**		**Date: OCT-02**		
3315	CERIODAPHNIA DUBIA (DAPHNID)	05/27/2016	05/26/2017	N	WET	IN

This analyte list supersedes all previously issued analyte lists. Method accreditation does not imply acceptance for NHDES compliance testing. Customers may verify the laboratory's current accreditation status by calling at (603) 271-2998. Laboratory is required to use EPA approved/accepted methods where required by regulation.

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(860) 643-9560
Lab ID: 2071

NELAP RECOGNIZED

Analyte Code	Analyte Name	Effective Date	Expiration Date	Matrix	Category	Accr. Type

NEW ENGLA 05/27/2016

Bill Hall
NH ELAP Program Manager
Issue Date: 05/27/2016

Matrix Legend: D=Drinking Water; N=Non-Potable Water; SC=Solid and Chemical Materials

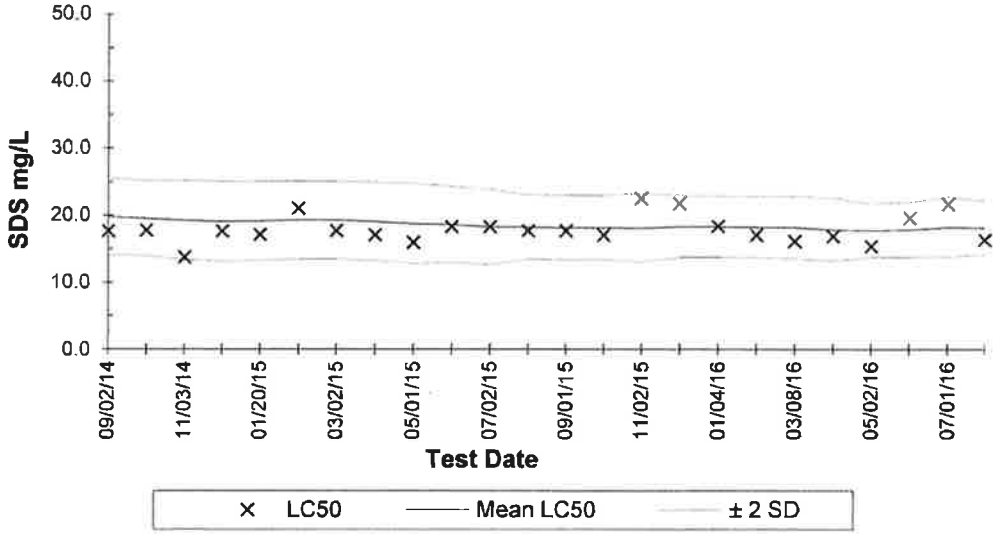
Category Legend: MIC=Microbiology; MET=Metals; NMI=Non-Metal Inorganics; PRE=Preparation; VOC=Volatile Organic Compounds; SBN=SVOC-BNA; SHE=SVOC-Herbicides; SNO=SVOC-NOS; SPC=SVOC-PCB; SPE=SVOC-Pesticides; RAD=Radiochemistry; WET=Wet

Accreditation Legend: NE=NELAP; NH=NH State Certification; CE=State Certification; IN=Interim (NELAP); WI=Withdrawn; AP=Applied; RE=Revoked; SU=Suspended

This analyte list supersedes all previously issued analyte lists. Method accreditation does not imply acceptance for NHDES compliance testing. Customers may verify the laboratory's current accreditation status by calling at (603) 271-2998. Laboratory is required to use EPA approved/accepted methods where required by regulation.

New England Bioassay
Reference Toxicant Data: *Mysidopsis bahia* 48-hour LC50

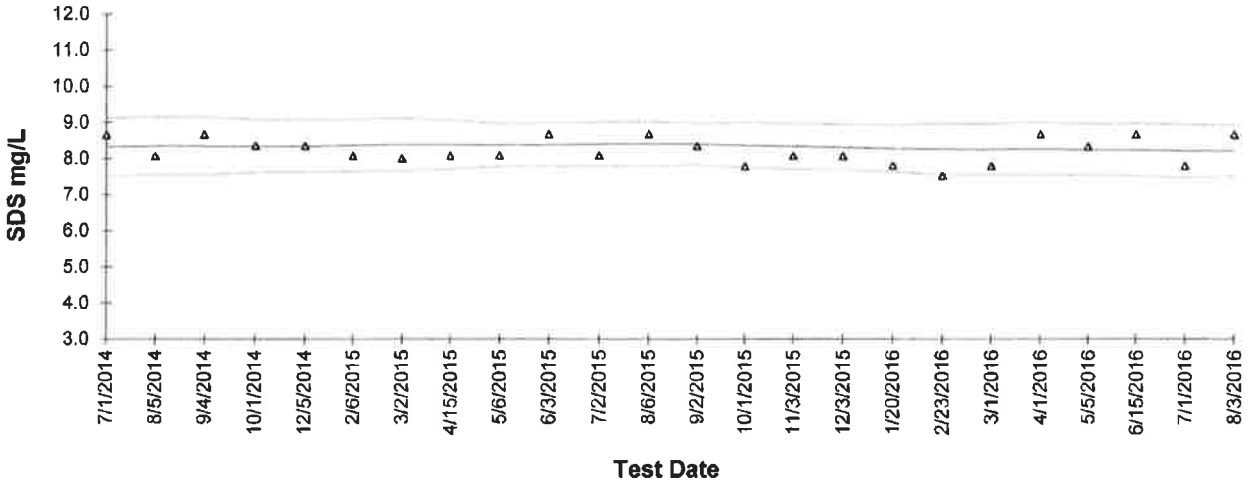
Reference Toxicant: Sodium Dodecyl Sulfate
Test Dates: Sept 2014 - Aug 2016



Test ID	Date	LC_{50}	Mean LC_{50}	STD	-2STD	+2STD	CV	CV National 75th & 90th%
14-1375	9/2/2014	17.7	19.8	2.9	14.1	25.6	0.14	0.26
14-1573	10/1/2014	17.7	19.5	2.8	13.9	25.1	0.14	0.26
14-1819	11/3/2014	13.8	19.3	3.0	13.4	25.2	0.15	0.26
14-1962	12/1/2014	17.7	19.1	3.0	13.1	25.0	0.16	0.26
15-109	1/20/2015	17.1	19.1	3.0	13.2	25.1	0.15	0.26
15-140	2/2/2015	21.0	19.3	2.9	13.5	25.1	0.15	0.26
15-258	3/2/2015	17.7	19.3	2.9	13.5	25.1	0.15	0.26
15-414	4/1/2015	17.1	19.1	2.9	13.2	24.9	0.15	0.26
15-549	5/1/2015	15.9	18.7	3.0	12.8	24.7	0.16	0.26
15-704	6/1/2015	18.3	18.6	2.9	12.9	24.3	0.15	0.26
15-900	7/2/2015	18.3	18.3	2.8	12.7	23.9	0.15	0.26
15-1082	8/3/2015	17.7	18.3	2.4	13.5	23.1	0.13	0.26
15-1296	9/1/2015	17.7	18.2	2.4	13.4	23.0	0.13	0.26
15-1458	10/1/2015	17.1	18.2	2.4	13.5	23.0	0.13	0.26
15-1687	11/2/2015	22.5	18.1	2.5	13.1	23.2	0.14	0.26
15-1776	12/1/2015	21.8	18.4	2.3	13.8	23.0	0.13	0.26
16-34	1/4/2016	18.4	18.3	2.3	13.7	22.9	0.12	0.26
16-142	2/1/2016	17.1	18.3	2.3	13.7	22.8	0.12	0.26
16-338	3/8/2016	16.1	18.2	2.3	13.6	22.9	0.13	0.26
16-460	4/1/2016	16.9	17.9	2.3	13.2	22.5	0.13	0.26
16-600	5/2/2016	15.4	17.8	2.0	13.7	21.8	0.11	0.26
16-709	6/1/2016	19.6	17.9	2.0	13.8	22.0	0.11	0.26
16-849	7/1/2016	21.7	18.3	2.2	13.8	22.7	0.12	0.26
16-1058	8/1/2016	16.3	18.2	2.0	14.1	22.2	0.11	0.26

New England Bioassay
Reference Toxicant Data: *Menidia beryllina* 48-hour LC50

Reference Toxicant: Sodium Dodecyl Sulfate
Test Dates: July 2014 - Aug 2016



Test ID	Date	LC_{50}	Mean LC_{50}	STD	-2STD	+2STD	CV	CV National 75th%	CV National 90th%
14-1014	7/1/2014	8.7	8.3	0.4	7.5	9.1	0.05	0.21	0.44
14-1203	8/5/2014	8.1	8.3	0.4	7.6	9.1	0.05	0.21	0.44
14-1395	9/4/2014	8.7	8.3	0.4	7.5	9.1	0.05	0.21	0.44
14-1574	10/1/2014	8.4	8.3	0.4	7.6	9.1	0.04	0.21	0.44
14-1983	12/5/2014	8.4	8.3	0.4	7.6	9.1	0.04	0.21	0.44
15-142	2/6/2015	8.1	8.4	0.4	7.6	9.1	0.04	0.21	0.44
15-143	3/2/2015	8.0	8.4	0.4	7.6	9.1	0.04	0.21	0.44
15-585	4/15/2015	8.1	8.4	0.3	7.7	9.1	0.04	0.21	0.44
15-623	5/6/2015	8.1	8.4	0.3	7.8	9.0	0.04	0.21	0.44
15-705	6/3/2015	8.7	8.4	0.3	7.8	9.0	0.04	0.21	0.44
15-901	7/2/2015	8.1	8.4	0.3	7.8	9.0	0.04	0.21	0.44
15-1083	8/6/2015	8.7	8.4	0.3	7.8	9.0	0.04	0.21	0.44
15-1297	9/2/2015	8.4	8.4	0.3	7.8	9.0	0.03	0.21	0.44
15-1539	10/1/2015	7.8	8.4	0.3	7.7	9.0	0.04	0.21	0.44
15-1688	11/3/2015	8.1	8.3	0.3	7.7	9.0	0.04	0.21	0.44
15-1825	12/3/2015	8.1	8.3	0.3	7.7	8.9	0.04	0.21	0.44
16-108	1/20/2016	7.8	8.3	0.3	7.6	8.9	0.04	0.21	0.44
16-260	2/23/2016	7.5	8.3	0.4	7.6	9.0	0.04	0.21	0.44
16-303	3/1/2016	7.8	8.3	0.4	7.5	9.0	0.04	0.21	0.44
16-461	4/1/2016	8.7	8.3	0.4	7.5	9.0	0.04	0.21	0.44
16-602	5/5/2016	8.3	8.3	0.4	7.5	9.0	0.04	0.21	0.44
16-798	6/15/2016	8.7	8.2	0.4	7.5	9.0	0.04	0.21	0.44
16-850	7/1/2016	7.8	8.2	0.4	7.5	8.9	0.04	0.21	0.44
16-1060	8/3/2016	8.7	8.2	0.4	7.5	8.9	0.04	0.21	0.44